

2017



Blue Hills State Reservation

Deer Management
Program

dcr
Massachusetts



MASSWILDLIFE

Department of
Conservation & Recreation

Division of Fisheries & Wildlife



Commonwealth of Massachusetts

Governor
Charles D. Baker

Lieutenant Governor
Karyn E. Polito

Energy & Environmental Affairs Secretary
Matthew A. Beaton

DCR Commissioner
Leo P. Roy

DFG Commissioner
Ronald Amidon



DCR Mission Statement

To protect, promote,
and enhance our
common wealth of
natural, cultural, and
recreational resources



MASSWILDLIFE

DFW Mission Statement

The Massachusetts Division of Fisheries and Wildlife (MassWildlife) is responsible for the conservation - including restoration, protection, and management - of the state's natural heritage of wildlife and habitat diversity for the benefit and enjoyment of the public now and into the future.

dcr
Massachusetts



Thank You
to Our Partners!



FRIENDS OF THE
BLUE HILLS
PROTECT • PRESERVE • PARTICIPATE

Tonight's Meeting – Purpose & Overview

- Provide context and rationale for continued deer management in the Blue Hills Reservation
- Review outcomes and results of last year's controlled hunt
- Review results and findings of this year's deer abundance surveying
- Review proposed 2017 Deer Management Plan program components
- Obtain public input on the 2017 Management Plan

Context for Deer Management

- Regeneration of a diversity of trees is critical to the survival of forests and their ability to recover from natural disturbances
- Deer browse selectively, so high deer densities can limit forest regeneration and reduce habitat diversity
- As stewards of the Blue Hills Reservation, DCR is concerned with the long-term health of the forest due to impacts related to high deer densities.



Causes of Deer Overabundance

- Elimination of major historic predators; such as mountain lions and wolves
- Hunting had not been allowed in the Blue Hills – unlike the majority of other DCR properties where hunting is allowed.
 - Lack of hunting in the Blue Hills created sanctuary habitat favorable to deer population increases.



5.83 mi²
Open to
Hunting

58 Deer
Harvested

10 deer/mi²
Overall
Reduction

Blue Hills Reservation

Huntible Lands

- Shotgun Only
- Archery Only
- Closed 2016
- Closed to Hunting
- Discharge Setback

Deer Harvest = 8
(15 deer/mi² reduction)

Deer Harvest = 5
(6 deer/mi² reduction)

Deer Harvest = 12
(14 deer/mi² reduction)

Deer Harvest = 7
(4 deer/mi² reduction)

Deer Harvest = 9
(15 deer/mi² reduction)

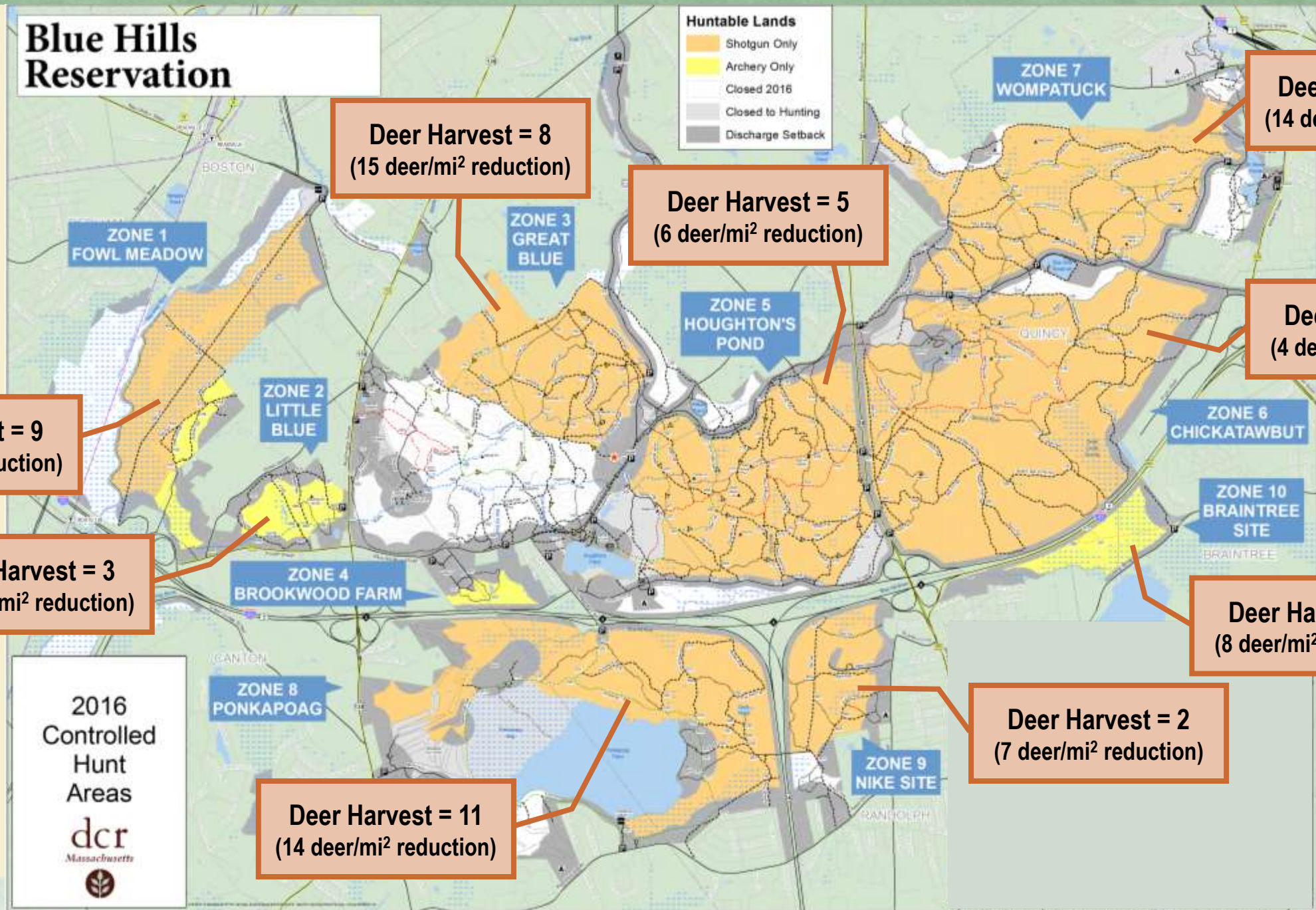
Deer Harvest = 3
(27 deer/mi² reduction)

Deer Harvest = 1
(8 deer/mi² reduction)

Deer Harvest = 2
(7 deer/mi² reduction)

Deer Harvest = 11
(14 deer/mi² reduction)

2016
Controlled
Hunt
Areas
dcr
Massachusetts



2017 Deer Abundance Surveys

- Conducted between February – April 2017
- Two separate surveys using two different methodologies:
 - **Pellet –Group Counts**: same method used to estimate deer abundance at the Quabbin Reservoir Reservation
 - **Distance Sampling**: same method used in 2013 to initially estimate deer abundance in the Blue Hills

2017 Deer Abundance Surveys: Pellet-Group Counts

- Advantages of Pellet-Group Counts:
 - Deer droppings are easy to see, don't move, and can be counted over a longer period of time
 - Counting droppings is relatively straight forward and can be done with a minimal amount of equipment or personnel
 - Pellet count surveys allow a finer-scale look at deer numbers by area within the Reservation
 - Pellet count transects are randomly placed in the Reservation, which limits bias and leads to more accurate density estimates

Published Reports on Pellet-Group Counts

Human-Wildlife Interactions 7(1):60–68, Spring 2013

Reliability and precision of pellet-group counts for estimating landscape-level deer density

DAVID S. DECALESTA,¹ Forestry Sciences Laboratory, Northeastern Research Station, U.S. Department of Agriculture, Forest Service, P.O. Box 267, Irvine, PA 16329, USA

Abstract: This study provides hitherto unavailable methodology for reliably estimating deer density within forested landscapes, enabling quantitative rather than qualitative deer management. Reliability and precision of the deer pellet-group technique in 1 small and 2 large forested landscapes. Density estimates, adjusted to reflect overwinter mortality, were compared with a drive count on the small landscape and aerial counts using forward-looking infrared videography (FLIR) on the large landscapes by 2 expert and 2 novice counters (range = 17.6 to 19.6 deer/ha). Pellet-group counts were not different from each other and three of the four were not different from the drive count (17.4 deer/ha). FLIR density estimates were approximately 10% higher than pellet-group estimates on the large landscapes ($P < 0.04$), an expected result. The small landscape was high; 95% confidence intervals for individual counts were wide, and coefficients of variability were $>10\%$. Precise estimates of deer density in large landscapes were 18.4 to 30.4% and coefficients of variability were $<25\%$. The pellet-group technique produced precise estimates of deer density, is inexpensive, requires little training to use, and is best suited to northern hardwood forests where snow and cold result in minimal deer movement. Unless corrected for hunter harvest and overwinter mortality, pellet-group counts represent average overwinter density and overestimate spring densities.

Key words: density estimates, human-wildlife conflicts, *Odocoileus virginianus*, pellet-group technique, white-tailed deer

OVERABUNDANT WHITE-TAILED DEER (*Odocoileus virginianus*) negatively impact forest ecosystems in the northeastern United States (Tigman 1989, deCalesta 1994, McShea et al. 1997, Horsley et al. 2003). Managing these impacts has involved hunting to reduce densities to levels associated with acceptable impact and desirable herd health. Data on deer density and distribution are required for determining when and where to reduce deer density, by how much, and whether desired reductions are achieved (Rutberg and Naugle 2008, Curtis et al. 2009). Managers need a technique that provides reliable, precise, and economical estimates of deer density. The high cost of direct counts (i.e., aerial surveys, deer drives, and spotlight surveys) and questions over reliability and applicability of indirect counts (e.g., pellet-group counts, track counts, mark-recapture, and population reconstruction from harvest data) are valid concerns (Curtis et al. 2009).

Using infrared-triggered trail cameras (ITCs), Curtis et al. (2009) developed an accurate and precise methodology for estimating deer density within 2 small (263 ha and 458 ha)

suburban landscapes. That 1 camera per 33 ha cost of \$14/ha. Extrapolated to larger forestlands, however, produces inflated costs. A 5,000-ha forest would require 150 cameras at a cost of \$70,000. The cost of estimating deer density using forward-looking infrared (FLIR) fixed-wing aircraft and Berner, Pennsylvania, personal communication. The FLIR technique still is expensive. In a large landscape, the cost would be prohibitive. Managing deer and deer impacts in small landscapes need less expensive technology without sacrificing reliability or precision.

The pellet-group count could be an inexpensive and potentially reliable and precise method for estimating deer density over large and small landscapes. The technique involves counting deer pellet-groups along transects in spring after snow cover has melted and before leaf-out of ground vegetation (McCain 1948).

Deer Density Estimation and Deer Browse Impact Survey Protocol: 2005-06

By
David deCalesta, Ph.D.
Wildlife Analysis
Box 621
Hammondsport NY 14840
607-393-6978
Cell: 607-794-0019
e-mail: wildlife@earthlink.net

and
Timothy G. Pierson, Ph.D.
Penn State Cooperative Extension
17129 Route 6 West
Smythport, PA 16789-0504
Email: tim@psu.edu

ABSTRACT

In 1990, the deer pellet group survey was carried out in Region 1 (Upper Peninsula) and Districts 5, 6, and 7 of the northern Lower Peninsula. Realignment of District and Regional boundaries precluded a pellet group survey in District 8. Therefore, Region 1 deer population figures prior to 1990 cannot be compared to the totals from Districts 5, 6, and 7 in 1990. The average over-winter population (unadjusted) in Region 1 was estimated to be 478,066 while the total for Districts 5, 6, and 7 was 399,893 during the 1989-90 winter. After legal kill and over-winter losses are considered, the spring deer population prior to fawning was estimated at 433,330 animals in Region 1, and a total of 348,132 in Districts 5, 6 and 7.

Ecological Indicators 10 (2010) 1226–1230

Contents lists available at ScienceDirect

Ecological Indicators

journal homepage: www.elsevier.com/locate/ecolind



Short communication

Estimating roe deer abundance from pellet group counts in Spain: An assessment of methods suitable for Mediterranean woodlands

P. Acevedo^{a,b,*}, J. Ferreres^c, R. Jaroso^b, M. Durán^b, M.A. Escudero^c, J. Marco^c, C. Gortázar^b

^a Biogeography, Diversity, and Conservation Research Team, Department of Animal Biology, Faculty of Sciences, University of Málaga, 29071 Málaga, Spain

^b Instituto de Investigación en Recursos Cinegéticos (ISCi-CRUE-URJA-JCOM), Ronda de Toledo s/n, 13071 Ciudad Real, Spain

^c Elevadora S.L. Camino de Cabezas s.n., 50730 El Negro de Ebro, Zaragoza, Spain

ARTICLE INFO

Article history:

Received 17 January 2010

Received in revised form 25 March 2010

Accepted 26 April 2010

Keywords:

Deer management
Mediterranean woodland
Faecal counts
Population abundance
Roe deer
Ungulates

ABSTRACT

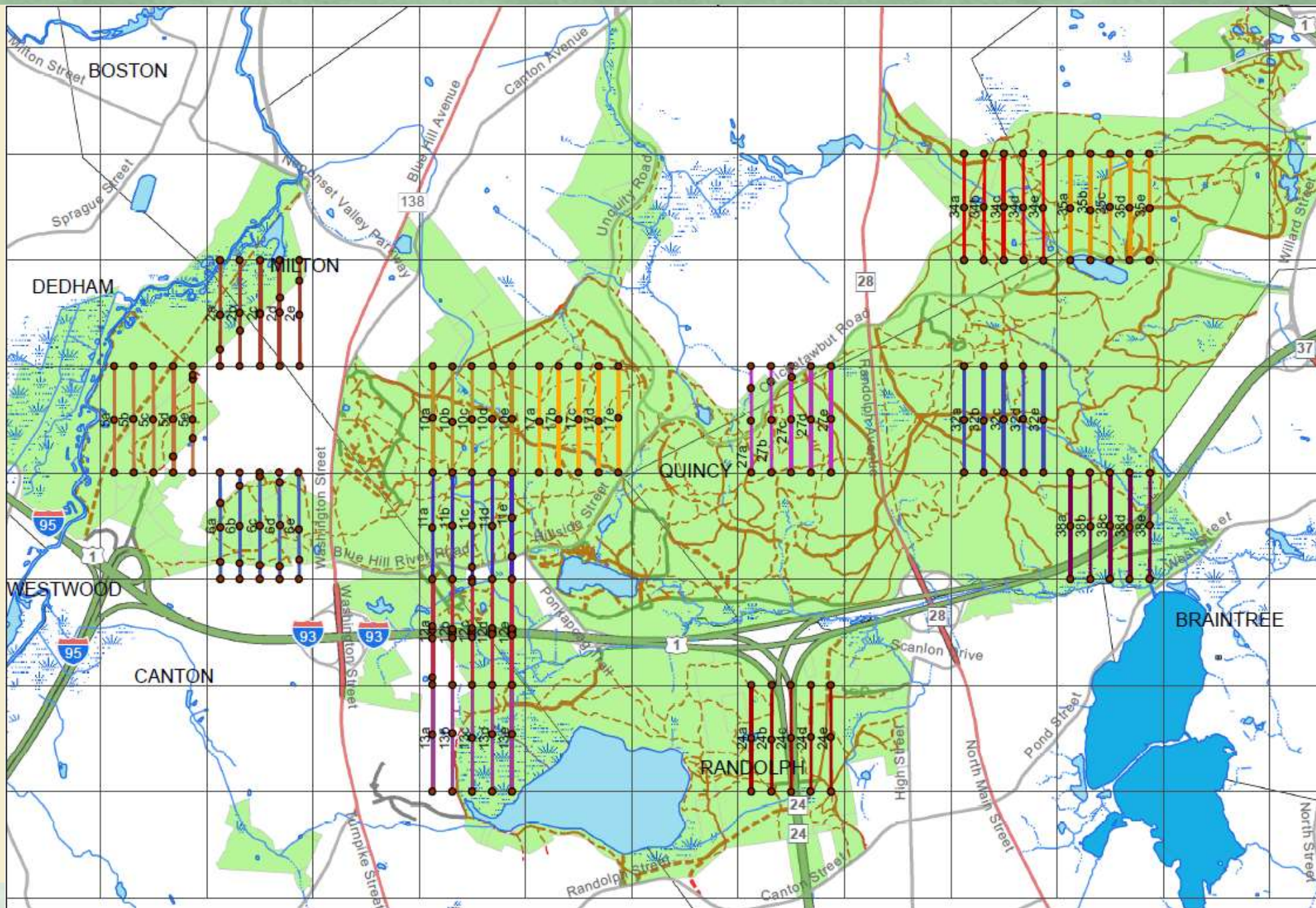
Despite the generalized expansion of wild ungulates in Europe, roe deer (*Capreolus capreolus*) is experiencing contrasted population trends; it is expanding in some regions while declining in others likely due to the expansion of other deer species. In both extremes, reliable methods to estimate population abundance are required. We evaluated different methods of estimating deer abundance in Mediterranean woodlands based on pellet group counts. Distance Sampling applied to pellet counts and a new easier and cost-effective method based on strip-variable transect counts (FST) were assessed comparing their estimates (pellet group density) with the abundance indices obtained from traditionally used reference methods (faecal standing crop) in 61 localities ($n = 183$ surveys). The average roe deer density estimated from faecal standing crop was 5.56 ± 0.75 (range 0.01–20.74) deer per 100 ha. Distance Sampling and FST estimates correlated with reference methods. As a first conclusion it may be noted that all indirect methods used here can be used to estimate roe deer abundance. The selection of a given method based on pellet counts to estimate roe deer population abundance should take into account the specific objectives of the research, resources available, and the timescale in which the information is required. Among the methods evaluated, FST is a rapid and easy method to use, and its results are not biased by Elsevier Ltd. All rights reserved.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Wildlife Division Report No. 3138
March 1991
THE 1990 DEER PELLET GROUP SURVEYS*
by Harry R. Hill

by preferred in woodland habitats as they are potentially biased. Thus, several indirect faecal pellet count methods to estimate population abundance in woodlands including (i) the number, or frequency, of faecal pellets (Acevedo et al. 2007), (ii) the number of faecal pellets per unit area (Smart et al. 2004) and (iii) the number of pellets on line transects to estimate faecal pellet density (Curtis et al. 2001). Only the last two families of methods estimate pellet group densities and, even so, require knowledge of the defecation rate by deer. The FST method is based on counts of pellets in plots, and faecal accumulation rate (FAR) and Ratcliffe, 1987). The difference between FAR and FST is measured by initially clearing the plot and then re-sampling after a fixed period. If pellet groups accumulated during the period, the FST is a more accurate method than FAR (Smart et al., 2004). FST size was also taken into account in the FST method (Acevedo et al., 2008).

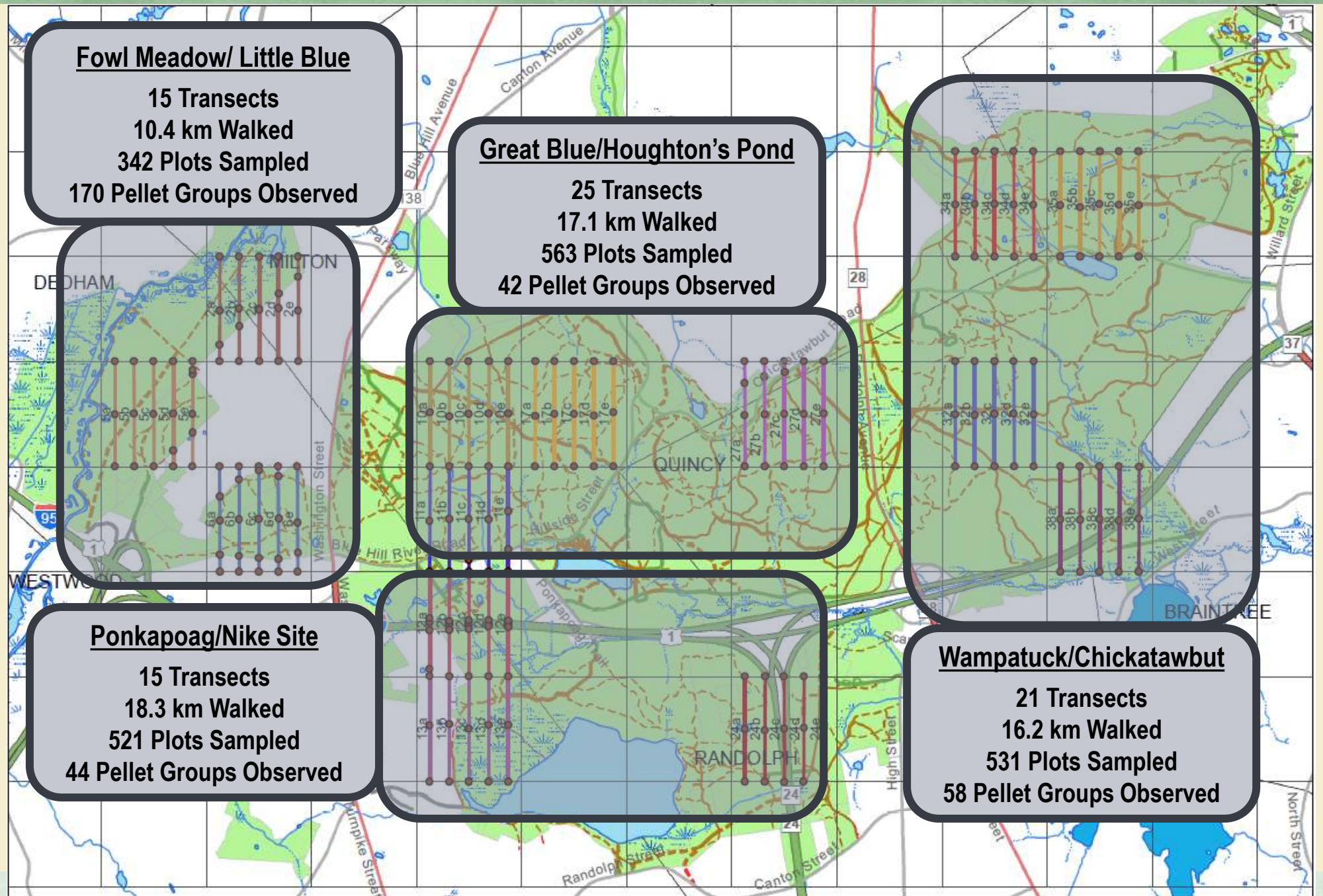
¹ Present address: P.O. Box 621, Hammondsport, NY 14840, USA

Transect Locations



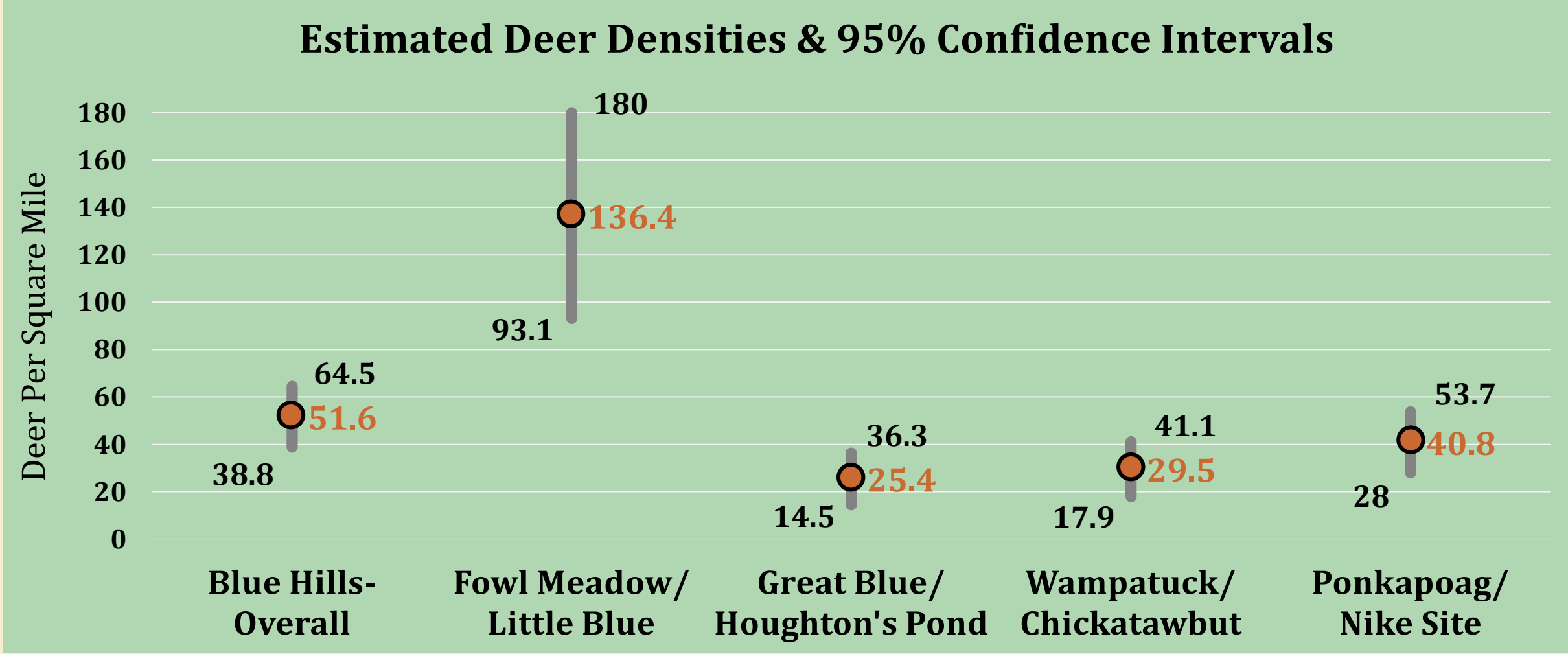
Pellet-Group Counts

Survey Effort & Observations



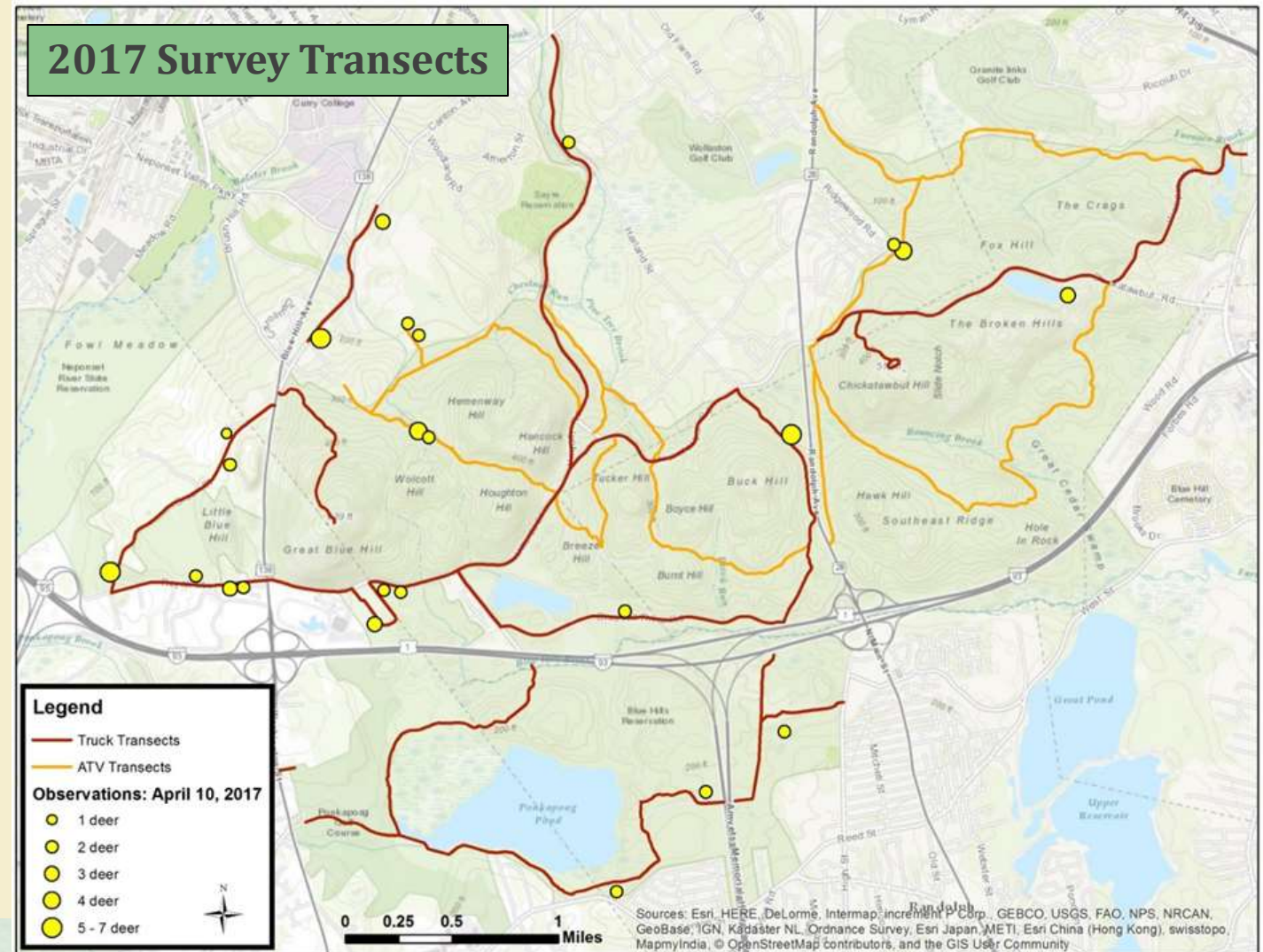
2017 Deer Abundance Surveys: Pellet-Group Counts

Estimated Deer Densities & 95% Confidence Intervals



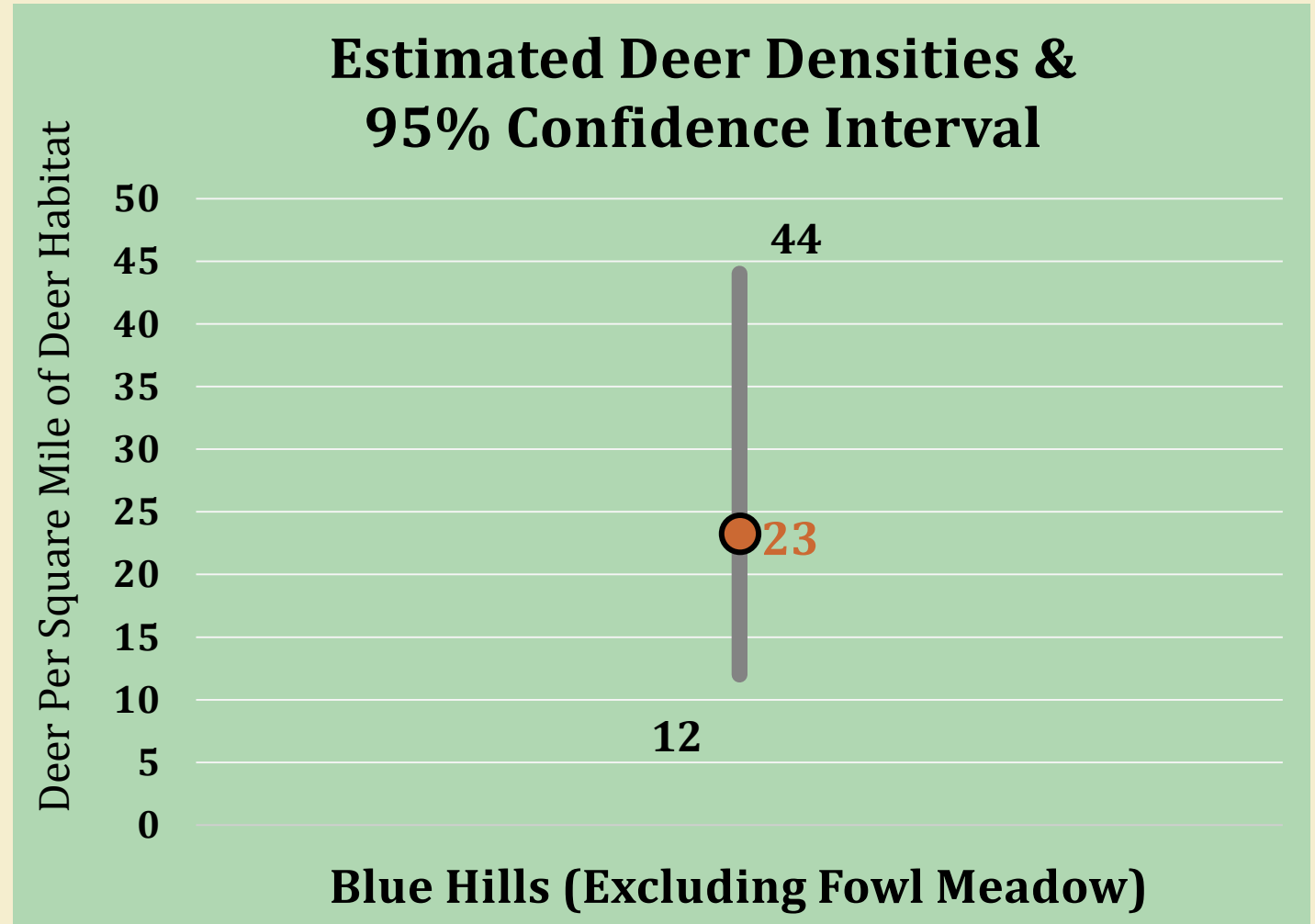
2017 Deer Abundance Surveys: Distance Sampling

- Conducted in April 2017
- Surveys began 30 minutes after sunset and lasted 5-6 hours
- Surveys were repeated over the course of 4 nights

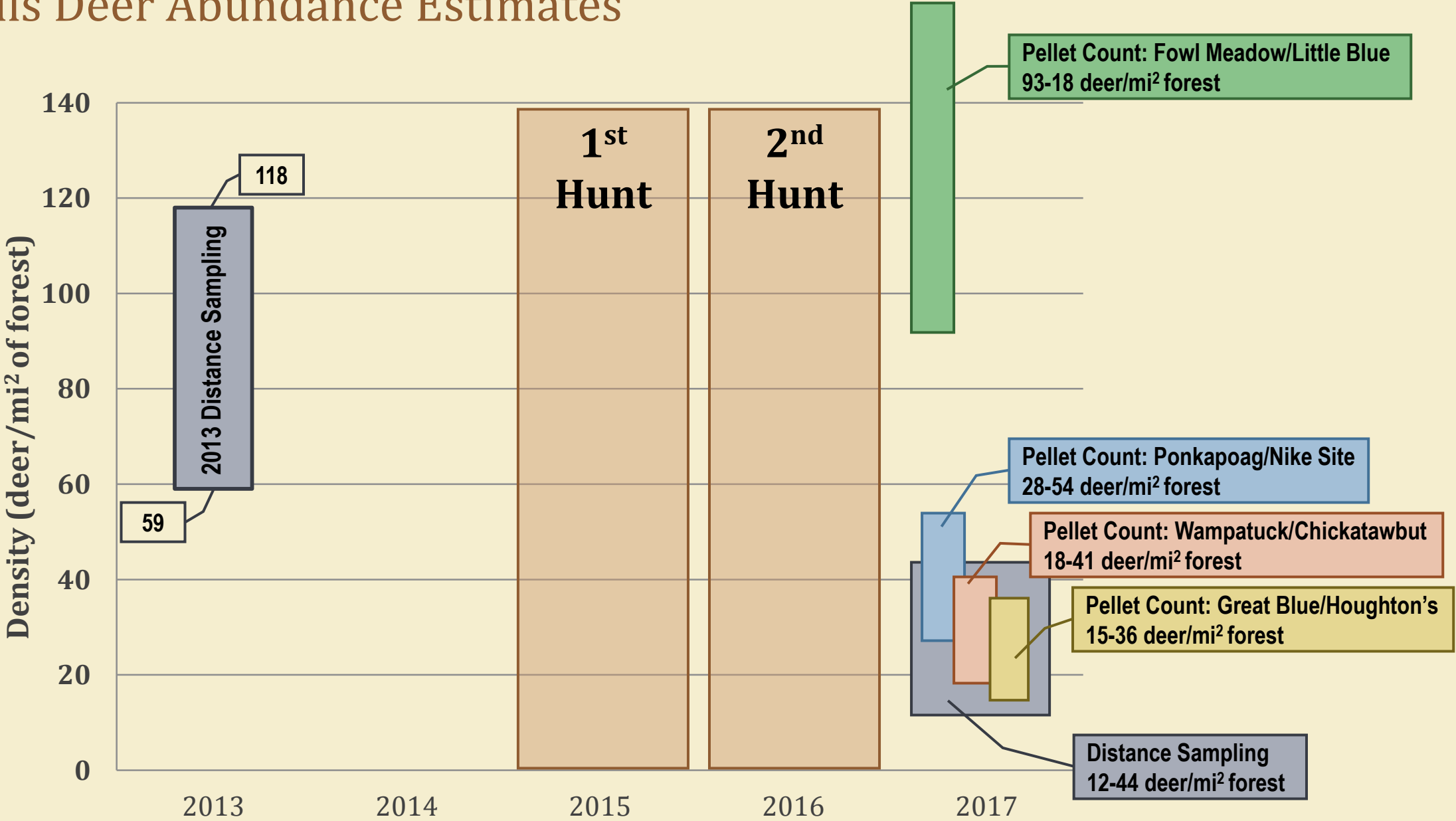


2017 Deer Abundance Surveys: Distance Sampling

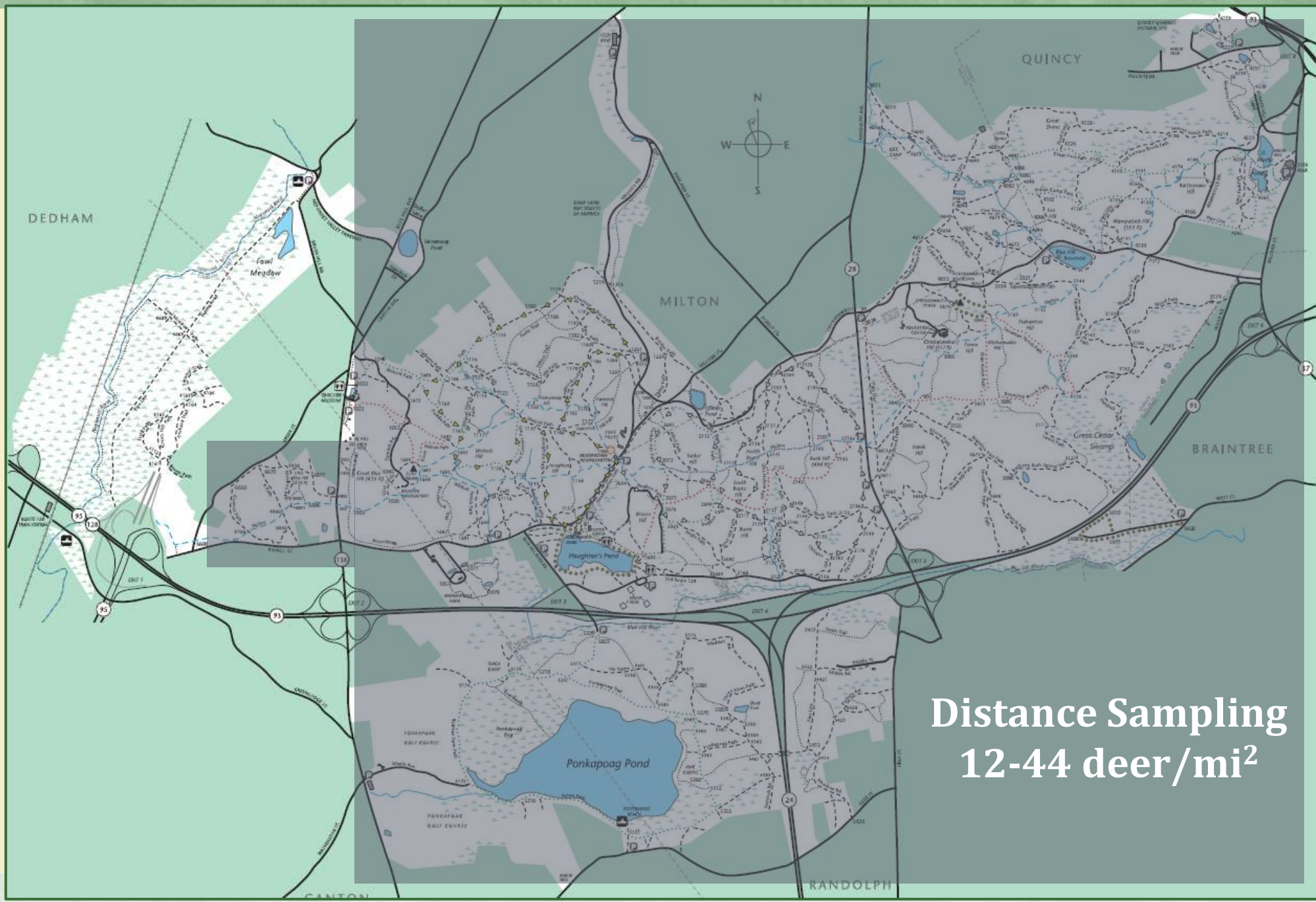
- 79 groups of deer (199 individual deer) detected
- Unable to survey Fowl Meadow due to lack of navigable trails (flooding)
- Note: the 2013 Distance Sampling survey did include Fowl Meadow



Blue Hills Deer Abundance Estimates



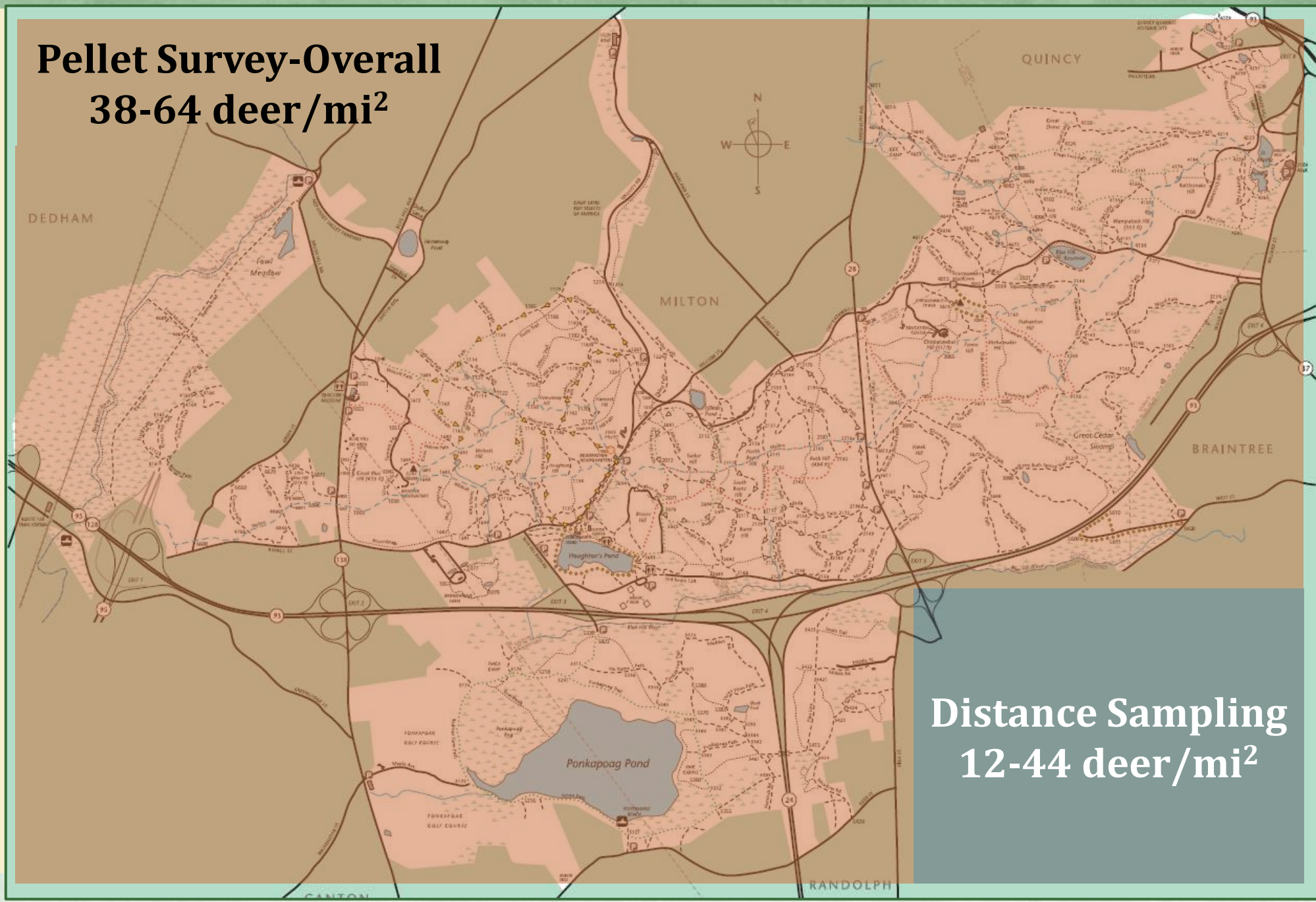
Blue Hills Deer Abundance Estimates



Distance Sampling
12-44 deer/mi²

Blue Hills
Deer
Abundance
Estimates

Pellet Survey-Overall
38-64 deer/mi²



Distance Sampling
12-44 deer/mi²

Blue Hills
Deer
Abundance
Estimates

Pellet Survey-Overall
38-64 deer/mi²

**Fowl Meadow/
Little Blue**

**91-180
deer/mi²**

Great Blue/Houghton's Pond

**14-36
deer/mi²**

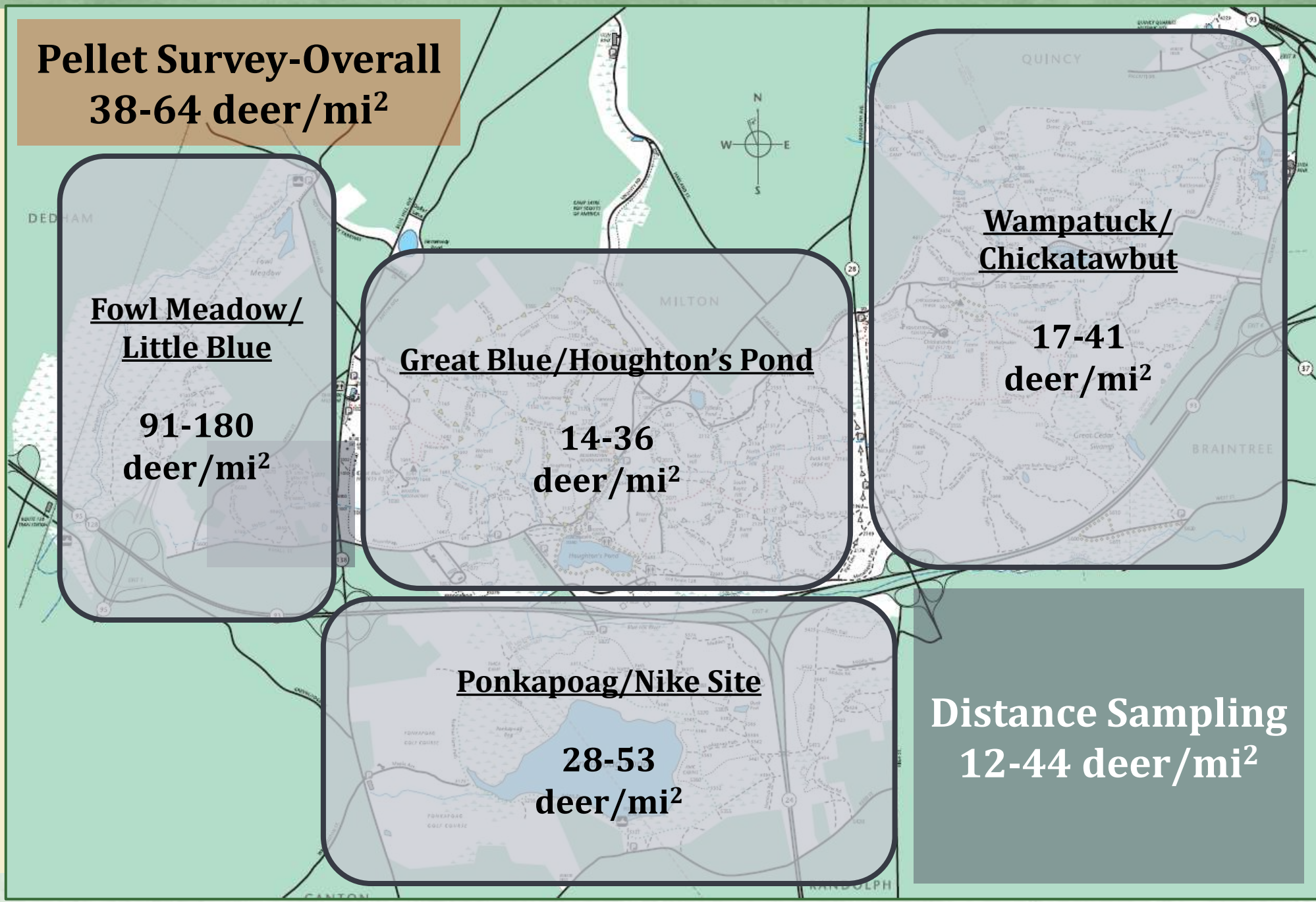
**Wampatuck/
Chickatawbut**

**17-41
deer/mi²**

Ponkapoag/Nike Site

**28-53
deer/mi²**

Distance Sampling
12-44 deer/mi²



Context & Need for Continued Deer Management

- The 2015 Blue Hills Deer Management Plan outlined a phased approach in which annual enhancements would be made in order to achieve reductions in overall deer densities.
- The 2015 Plan also made it clear that successful deer management requires a long-term effort and commitment
 - Deer populations can bounce back in the absence of management
- The Quabbin hunt has been in operation for 25 years and has worked to maintain deer densities below 20 deer/mi²

Context & Need for Continued Deer Management

- In committing to long-term management, DCR and MassWildlife will continue to implement controlled hunting in the Blue Hills in 2017
- Based upon prior experience and our assessment of outcomes from 2015 and 2016, additional enhancements have been introduced to:
 - Increase efficacy of the Deer Management Program and
 - Supplement other deer management efforts currently taking place on nearby private lands.

2017 Blue Hills Deer Management Plan

Phase 1: Permitted Archery Hunting During November

- **Rationale**: Archery hunting provides a finer-scale approach to increase harvest in certain areas where surveys suggest higher deer numbers and where habitat conditions (e.g. brushy and swampy) can limit harvest during the short controlled hunt.
- DCR will permit limited archery hunting in designated areas of the Reservation on **Mondays through Thursdays** between **November 6th and November 22nd**
- A total of 790 acres will be opened to archery hunting during this time
- Licensed hunters will be required to apply
- A single group of 75 hunters will be selected (via random lottery) to receive access permits to hunt during this time

Blue Hills Reservation: 2017 Permitted Archery Hunting Areas

**Fowl
Meadow
387 Acres**

**Great Blue
58 Acres**

**Little Blue
70 Acres**

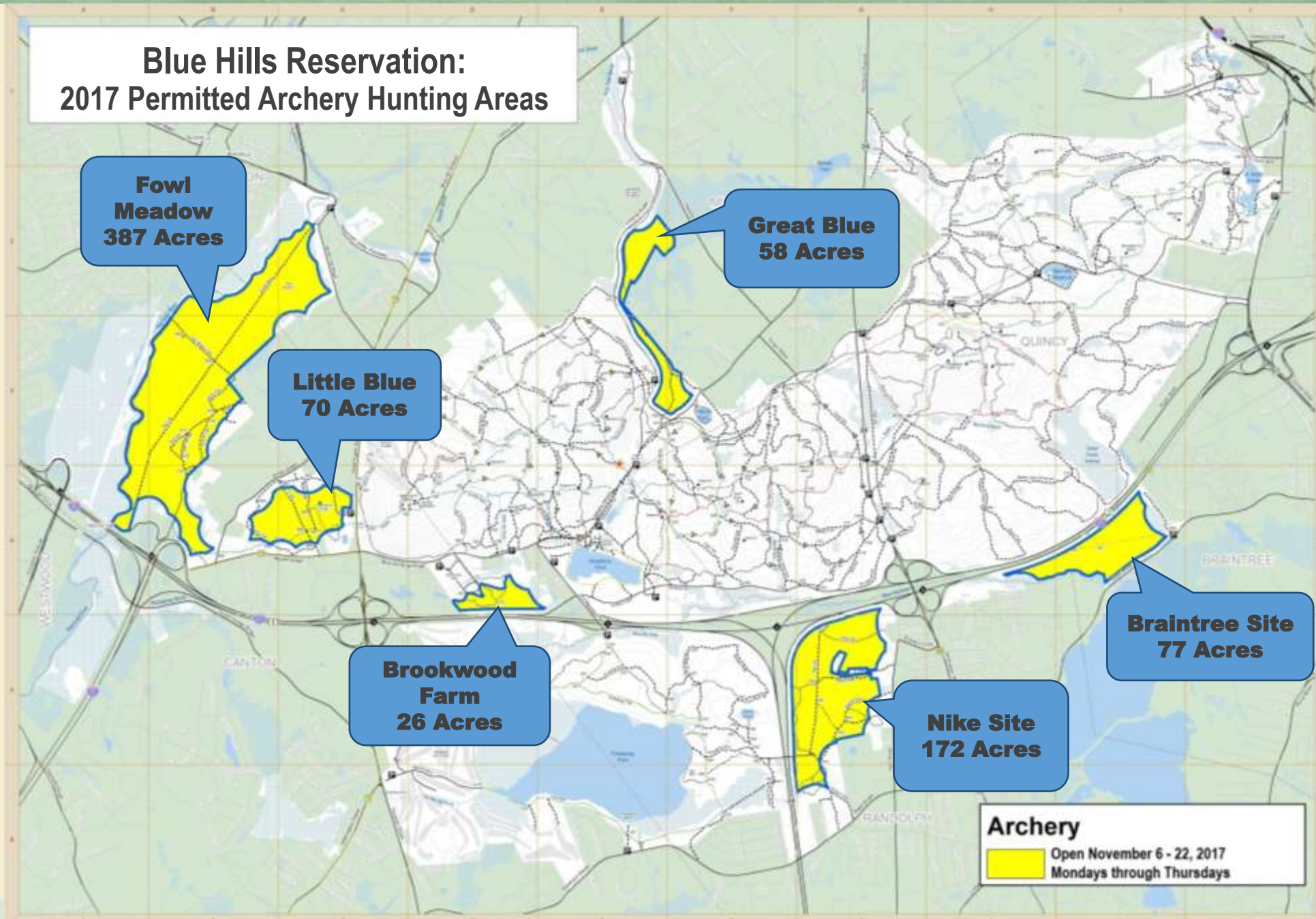
**Brookwood
Farm
26 Acres**

**Nike Site
172 Acres**

**Braintree Site
77 Acres**

Archery

Open November 6 - 22, 2017
Mondays through Thursdays



2017 Blue Hills Deer Management Plan

Phase 2: Controlled 4-Day Shotgun Hunt

- Similar to 2015 and 2016, DCR and MassWildlife will implement a controlled 4-day shotgun hunt on the following days:
 - Tuesday, November 28th & Thursday, November 30th
 - Tuesday, December 5th & Thursday, December 7th
- Shotgun only
- Total of 4,026 acres opened to hunting
- Two separate groups of 133 licensed hunters will be selected.
 - Group 1 will hunt on November 28th and 30th
 - Group 2 will hunt on December 5th and 7th

Blue Hills Reservation: 2017 Controlled Shotgun Hunt Areas

Zone 1
Fowl Meadow
(387 Acres)
13 Hunters

Zone 3
Great Blue
(716 Acres)
24 Hunters

Zone 4
Houghton's Pond
(574 Acres)
19 Hunters

Zone 6
Wampatuck
(613 Acres)
20 Hunters

Zone 2
Little Blue
(70 Acres)
2 Hunters

Zone 5
Chickatawbut
(1,004 Acres)
33 Hunters

Zone 7
Ponkapoag
(490 Acres)
16 Hunters

Zone 8
Nike Site
(172 Acres)
6 Hunters

2017 Hunttable Lands

- Shotgun Only
- Closed 2017
- Closed to Hunting
- Discharge Setback

Timeline

- August 9th: DCR & MassWildlife released the Management Plan and posted online
- August 14th: Public comment period began
- August 31st: Deadline to submit public comment
- Early September: issue final 2017 Management Plan

Additional Information

For more information:

- <http://www.mass.gov/eea/agencies/dcr/public-outreach/public-meetings/>
- <http://www.mass.gov/eea/agencies/dcr/massparks/blue-hills-controlled-deer-hunt.html>

If you have comments or suggestions:

- Option 1: Submit Online: <http://www.mass.gov/eea/agencies/dcr/public-outreach/submit-public/comments/>
- Option 2: Via Mail: Department of Conservation & Recreation
Office of Public Outreach
251 Causeway Street, Suite 600
Boston, MA 02114

Public Comments must be received by Thursday, August 31, 2017

Note: Public comments submitted to DCR may be posted on the DCR website in their entirety, and no content, including personal contact information, will be redacted.

If you have questions or concerns or wish to subscribe to a DCR general information or project-related listserv, contact DCR's Office of Community Relations at 617-626-4973 or mass.parks@state.ma.us

Questions & Comments



Blue Hills State Reservation

Deer Management
Program